

SUMMARY OF NEW LIBERIAN POLYDESMOIDEA.

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In a preceding paper¹ on the diplopod fauna of Liberia several new species and genera were referred to, of which a list is here given together with such additional diagnostic characters as may be necessary for the separation of the various forms from the territory explored. Extended descriptions and plates are in preparation.

Ammodesmus granum.

Locality, Mt. Coffee, a cluster of hills in western Liberia, reaching an altitude of about 300 feet, and covered with dense forest. A large part of the other forms were collected in the same vicinity, all except those of which other localities are specified.

Cenchrodesmus volutus.

Length about 2 mm., width .65 mm.

Campodesmus carbonarius.

Surface of head and segments covered with rough granules; first segment scarcely broader than the head, with three transverse rows of coarse tubercles; second segment broadest of all; segments with a cluster of three large tubercles on each side of the middle, five smaller scattered tubercles on each side of these, and three tubercles on each of the very broad, decurved carinæ; last segment not concealed, rounded at apex, with three broad, blunt, setigerous tubercles on each lateral edge; preanal scale with two long smooth setigerous papillæ. Length of male 29 mm., width 5.25 mm.; length of female 32 mm., width 6.5 mm.

Tropidesmus jugosus.

Generally similar to the preceding, except that the segments are dorsally ornamented with two transverse rows, each of six short longitudinal carinæ; also the tubercles of the preanal scale are short, not papilliform. Length 28 mm., width 5 mm.; locality Mt. Coffee and vicinity; much rarer than *Campodesmus*, and more inclined to burrow in the ground.

¹A New Diplopod Fauna in Liberia. American Naturalist, xxx, pp. 413-420, 1896.

Comodesmus lanatus.

Antennæ distinctly clavate; last segment decurved, the immediate apex small, projecting, truncate; lateral carinæ present only as a longitudinal row of large tubercles, above which the tubercles are gradually smaller; length 8 mm., width 1 mm.

Thelydesmus dispar.

Antennæ distinctly clavate; first segment nearly as wide as the second, scarcely concealing the head in front; segments with four regular transverse rows of conic piliferous granules; carinæ moderately broad, somewhat narrowed toward the margin, coarsely dentate all around by reason of the prominent granules, the largest of which is located at posterior corner; last segment triangular in outline, the edges dentate with setiferous tubercles, the apex narrow, with a small tubercle; females nearly black above, 18 mm. long, 3.25 mm. broad; males quite black above, less convex and more slender than the female, and with proportionately broader carinæ; length of male 15 mm., width 2.75 mm.; locality, Mt. Coffee; females not rare.

Discodesmus senex.

Smaller and more slender than *Comodesmus*; dorsum densely granular-tuberculate, the prominences subequal in size and setiferous; lateral carinæ nearly wanting, the segments slightly thicker at the sides and with larger tubercles; repugnatorial pore located above the lateral row of tubercles; color white.

Prepodesmus tigrinus.

This and its congeners have the copulatory legs with a large needle-like straight or slightly curved spine from the ventral or median face. The present species has the anterior margin of the first segment, the anterior lateral apices of the second and third segments, and the carinæ, or at least the posterior part of the carinæ of poriferous segments bright yellow, with the remainder of the body black; legs and antennæ reddish-yellow; length of female 42 mm., width 5 mm.; antennæ and longest legs 9 mm.; males distinctly smaller.

Prepodesmus mimus.

Of the same form and size, but with the anterior margin of the first segment, the carinæ of the second and third, and the whole posterior subsegments of the poriferous segments bright red; legs and antennæ reddish; locality, Muhlenburg Mission.

Tylodesmus crassipes.

Color entirely black, legs and antennæ yellowish; copulatory legs without the spine present in *Prepodesmus*, and with the interior lamina broad and flabellate; anterior male legs slightly, though distinctly, crassate; length of male 40 mm., width 4.5 mm.; length of female 43 mm.; width 5.6 mm.

Tylodesmus amœbas.

Anterior half of first segment, the carinæ of the second and third, and the whole of the poriferous segments, except the last two or three, bright red; the remainder of the body is black; legs and antennæ pale; legs of both sexes distinctly more slender than in the preceding species; sexes not strikingly unequal, though the male is more slender and has somewhat longer legs; length 35 mm., width of male, 4 mm., of female, 4.5 mm.; locality, Muhlenburg Mission. The color of this species is almost exactly that of *Prepodesmus mimus*.

Lyrodesmus nigerrimus.

The genus is evidently related to the last, and has a closely similar copulatory foot; it is distinct in being more slender and depressed, and in having the first segment lenticular or fusiform in outline, rather than hemispheric-elliptical as in the two preceding genera. The species is deep, shining black, including the legs and antennæ; length of male 35 mm., width 4 mm., legs 6 mm., antennæ 8 mm. in length. Very rare, only two specimens found. A third, nearly white in color and somewhat different in form, may prove to be specifically distinct.

Cheirodesmus ater.

First segment as in *Lyrodesmus*, but the angles not so pointed; body more slender, narrower, dorsum flat; carinæ with square corners, so that the poriferous callus projects from a nearly straight edge; copulatory legs less complicated, the slender branch shorter; color uniform black, legs and antennæ yellowish; length 30 mm.; width 3.75 mm.

Cheirodesmus discolor.

Similar to the preceding in size and form, but distinct at least in color; an area around each pore, and a moderately broad median line, yellow; legs and antennæ reddish-yellow; rare, only one pair taken, near Muhlenburg Mission.

Anisodesmus cerasinus.

Perhaps doubtfully distinct from *A. erythropus* (Lucas) in the greater size and lighter color, all the specimens from the interior differing thus from individuals collected at Monrovia. Length 41 mm., width of male 5.5, of female 6.5 mm. The length of what I have identified as *erythropus* is about 35 mm. The species can, however, hardly be determined with confidence from Lucas' description. Both forms are very beautiful in life, deep wine-color, with bright cherry-pink legs.

Isodesmus immarginatus.

Resembles *Lyrodesmus* and *Cheirodesmus*, but is distinctly broader than either, and distinct from all the related forms in the absence of a distinct poriferous callus, the margin being sinuate. Legs and antennæ more slender than in *Anisodesmus*, but less so than in *Lyrodesmus* and *Cheirodesmus*. Color uniform black, the antennæ and apical joints of the legs also dark. Copulatory legs also very distinct in that the outer ramus is broad and bifid, while the inner is trifid, giving five distal divisions. Length 42 mm., width 5 mm.

Isodesmus interruptus.

Is somewhat larger than the above and has the carinæ of the poriferous segments pale yellow. It is known from a female specimen only.

Oxydesmus medius.

Black or very dark vinous; carinæ concolorous; legs and antennæ also dark; length 52-66 mm., width 10-12 mm.

Oxydesmus liber.

Dark chocolate-brown to black; ends of the carinæ, especially the submarginal ridge, yellow or orange; antennæ and legs light yellow or orange; length 68-80 mm., width 12-13 mm.

Bactrodesmus claviger.

Antennæ very long and slender, clavate, sixth joint longest, scarcely exceeding the third; dorsum much as in *Polydesmus*, with three rows of scattering tubercles, each with a large clubbed hair; pores dorsal, of the usual arrangement; penultimate segment toothed behind; first legs reduced, the second greatly enlarged, especially the penultimate joint; last joint curved; claw very short, broad; copulatory legs with the basal joint much enlarged, galeate, containing the apical joint when at rest; length 7 mm., width 1 mm.

Pterodesmus brownellii.

Last segment exceeded and included by the penultimate, the posterior sinus of which is nearly square, longer than broad; copulatory legs excised at apex, the posterior lobe longer, laterally excised, the anterior broad, with three or four short teeth; length 28 mm., width 7 mm.

Gypsodesmus pruinosus.

Dorsum very flat, the carinæ curved gently upward toward the posterior corners, and as high as the middle of the segments; last segment subequal to the penultimate in length, the sinus of the latter broader, the sides diverging; copulatory legs with the dorsal ramus long, strongly decurved and turned mesad; length 16 mm., width 4 mm.

Lampodesmus volvatus.

Dorsum distinctly convex, the carinæ slightly decurved, nearly in the direction of the dorsal arch; last segment and copulatory legs somewhat as in *Gypsodesmus*; male legs crassate, especially the anterior; two large and conspicuous processes from the sternum of the sixth legs of males; length 24 mm., width 5.7 mm.

Compsodesmus pulcher.

About as convex as the last, but the sides sloping more directly from the middle; no processes from the sixth segment; male legs scarcely crassate; copulatory legs very simple, apically somewhat cup-shaped; penultimate segment with sinus broader; length 24.5 mm., width 6.5 mm.

Choridesmus citus.

Last segment nearly or quite concealed under the penultimate; length 5.5 mm., width 1.5 mm.

Scolodesmus grillator.

Dark vinous, a narrow, poorly-defined median spot on each posterior subsegment, giving the effect of a pale median line; legs and antennæ pinkish or yellowish; length 28 mm., width 2.5 mm., the first segment as broad as any, the other anterior segments distinctly narrower; locality, Monrovia.

Habrodesmus lætus.

Length of male 27 mm., width 2 mm.; width of female 3 mm.

Stylodesmus horridus.

Length 10 mm., width 3.2 mm.; the processes of the seventeenth and eighteenth segments project far behind the nineteenth, which

has neither process nor pores. The first and eighteenth segments have the processes united for more than half their length.

Udodesmus telluster.

Length 8.5 mm., width 1.25 mm.; penultimate segment projecting beyond the last, but not exceeded by the processes of the eighteenth, which are not coalesced; processes trituberculate at apex; first segment with two large processes, and four large lobes in front, the median notch large, deep, rounded.

Hercodesmus aureus.

Length 6.75 mm., width .75 mm.; last segment exceeded by the penultimate; processes replaced by longitudinal ridges; carinæ very narrow; first segment with margin very faintly lobed.

Stiodesmus stratus.

Length 10 mm., width 1.4 mm.; last segment not concealed; first segment not lobed, but, like the rest of the dorsal surface, beset with rounded granules or tubercles. The affinities of this form are somewhat obscure. The general appearance and sculpture suggest *Comodesmus*, but the form of the first and last segments and the structure and location of the pores are very different. It may prove to be one of the *Cryptodesmidæ*, in the sense of being more nearly related to *Cryptodesmus olfersii* than to the other species which have been described under that much over-worked generic name.

RELATED FORMS NOT FOUND IN LIBERIA.

Xyodesmus planus.

Related to *Thelydesmus*, but distinctly more depressed, especially the male. Last segment broad at apex and with a large, conic, marginal tubercle on each side nearly equalling the apex; dorsum densely beset with conic tubercles; carinæ broad, dentate, with numerous pointed-conic tubercles; antennæ scarcely clavate; head not concealed; first segment narrower than the second; sterna granulate, especially in the female; color nearly black; length 21 mm., width of male 3.75 mm.; of female 4 mm.; locality, Bismarck-burg, Togo Colony, Dr. K. Büttner; Berlin Museum.

Helodesmus porosus.

Related to *Comodesmus* rather than to the other families, but with remarkable differences. First segment widest, concealing the head; body tapering caudad, subcylindric, not coiled into a spiral; dorsum very convex, rough with low granules, and incrustated with earth;

pores with distinct raised rims, located far above the slightly prominent carinæ of segments 5, 7-17; antennæ and legs very short and stout; copulatory legs of two simple, equal processes; segments of adult 19; color above black, below white; length of female 4 mm.; width .6 mm.; locality, mountains of Western Java, 8,000 feet. This species may be considered the type of a new family, *Helodesmidæ*.

Prepodesmus pictus.

Suggesting *P. tigrinus*, but the yellow areas of that species are here bright pink; legs and antennæ very dark reddish; length of male 45 mm., width 5.5 mm.; locality, Togo Colony; numerous specimens in the Berlin Museum.

Anisodesmus konakri.

Nearly black, margins of all carinæ yellowish; legs and antennæ pinkish, rather pale; dorsum less convex than in *A. cerasinus*, and the posterior corners of the carinæ less strongly dentate; copulatory legs not expanded at apex, but bent together at a right angle; locality Konakri, French Gambia, where I collected a pair of mature individuals, January, 1896.

Anisodesmus gracilis.

Very distinct from the Liberian species in the smaller and more slender body, and light pinkish color. Copulatory legs similar in form to the other species, but much more slender apically; length of male 27 mm., width 3.25 mm.; locality, Bismarckburg, Togo Colony, Dr. K. Büttner; Berlin Museum.

Lipodesmus sublævis.

Legs and antennæ moderately long; segments faintly granular or longitudinally rugulose toward the posterior margin; pores located on a distinct marginal callus projecting from about the middle of anterior and middle segments; in front of the callus is a distinct notch and tooth; posterior corner of anterior segments square, acute on posterior; copulatory legs rather robust, a spiniform process rising from each side of the unguis portion and curved cephalad (dorsad); length of male about 28 mm., width 3.8 mm.; locality, Karewia, East Africa, Stuhlmann; two male specimens in the Berlin Museum.

Scytodesmus kribi.

Dorsum roughened with five or six irregular rows of close-set distinct granules; submarginal ridge and last segment as in *Oxydesmus*; copulatory legs not flexed and inserted under the edge of the aper-

ture, but constructed somewhat as in *Oxydesmus*; length 50 mm., width 9 mm.; locality, Kribi, German Colony of Kamerun; a male specimen collected by Morgen is in the Berlin Museum.

Mimodesmus parallelus.

Vertex and dorsal surface smooth or faintly coriaceous, with neither granules, tubercles nor areas; posterior subsegments without a transverse furrow or depression; pores situated in the outer slope of the submarginal ridge, as in *Oxydesmus*; last segment much as in *Oxydesmus*, but the tubercles obsolete; anterior male legs distinctly crassate; copulatory legs long and twisted, apically recurved against the ventral surface of the segment; color a dull brown, with the submarginal ridges and a large spot in the middle of each posterior subsegment, yellowish; length 46 mm., width 6.5 mm.; locality, Karewia, East Africa, Stuhlmann; Berlin Museum.

Plagiodesmus obliquus.

Probably allied to and perhaps identical with *Stenonia occidentalis* Karsch, described from Quango. Distinct from the species of *Oxydesmus* by the very oblique submarginal ridges, which are wide and not prominent about the pores; copulatory legs long and somewhat twisted, not inserted under the edge of the aperture as in *Oxydesmus*; color dark vinous, nearly black; length about 75 mm., width 13 mm.; locality, Congo Valley; a few specimens in the British Museum.

Compsodesmus perlatus.

Length about 20 mm., width 7.5 mm., without the carinæ 2.3 mm.; color dark brown, marked with transparent radiating lines as in the other species of the present family; copulatory legs distally cupulate, the posterior rim produced caudad into a strong curved spine; locality, Kamerun hinterland; a male specimen collected by Zenker is in the Berlin Museum.

Tanydesmus ordinatus.

This genus is related to *Lampodesmus* and the allied Liberian forms, as previously noted. Dorsal areas arranged in three distinct transverse rows; pores distinct, of the usual formula, near the anterior edge of the carinæ, remote from the lateral margin; penultimate segment subequal with the last, the sinus rather broad, the sides distinctly diverging caudad; color in alcohol uniform light reddish-brown; length of male 19 mm., width 4.5 mm.; female 22 mm. by 5 mm.; locality, Togo Colony; several specimens in the Berlin Museum.

Scolodesmus securis.

Smaller and more slender than *S. grillator*; of the same color, but without a lighter median line or row of spots; sternum of fourth pair of legs with a large process more deeply bilobed than *S. grillator*; copulatory legs longer and more slender, reaching to the fourth segment, in general form like those of *S. grillator*; above the middle a curved acicular process projects from each, and the apices of the two lie in contact; apical portion gently curved mesad and pointed, with a large process from the inner side with a straight inner edge, its corners produced proximad and distad, suggesting the blade of a Roman axe; length of male 18 mm., width 1.6 mm; locality, Togo Coast; a male and a female in the Berlin Museum.

Habrodesmus falx.

Closely resembling *H. letus* in size and form, differing in that the copulatory legs end in a broad, obliquely truncate lamina with a small transparent process from near the middle of the apical edge. In *H. letus* the distal extremity is slender and curved, with two small teeth below the apex, so that the apical sinus is shaped like the figure 3. Color in alcohol, brown or black; the margins of the first, the posterior margins of the other segments, the ventral surface and legs, whitish; antennæ dark; several specimens from Togo are in the Berlin Museum. A label states that the legs are (in life) pinkish-red; a female specimen is slightly larger and more robust than the female of *H. letus*.

Napodesmus costatus.

Differing from *Udodesmus*, to which it is nearest related, in the more depressed body, the thin margins of the carinæ, and the four, fine, slightly elevated, dorsal longitudinal ridges or carinæ, scarcely separated into their component tubercles; surface rough, uneven, and finely setose, incrustated with earth, but without distinct tubercles; pores located at the posterior corners of segments 5, 7, 9, 10, 12, 13, 15-18, each surrounded by a frill of short, fine hairs; first segment with numerous large conic processes, anteriorly with four large subequal lobes, each of which is incised along the margin, the median with two incisions, the lateral with one; penultimate segment considerably exceeding and completely concealing the last; lobed at the sides, and slightly so at apex; length 6 mm., width 1.1 mm.; locality, the forests of Western Liberia, along creeks and rivers; rare.

Pelodesmus fossor.

Differing from *Udodesmus* in the more robust body, the squarer and broader dorsum, and the more prominent and stronger dorsal processes arranged in two rows; each process distinctly bifid, instead of indistinctly trifid, directed obliquely cephalad. The first segment lacks the inner pair of large lobes, which are apparently replaced by a pair of anteriorly directed large processes similar to those of the other segments; last segment much as in *Udodesmus*. Surface thickly incrustated with earth; length 7.5 mm., width 1.5 mm.; locality, Freetown, Sierra Leone, under stones in a moist, shaded place.

Stegodesmus leonis.

A recently discovered genus evidently related to *Udodesmus*, but distinct by remarkable characters. First segment nearly as broad as any, much broader than the second, about twice as broad as long, strongly decurved, the anterior margin transverse, entire, decurved, completely concealing the head; antennæ distinctly clavate, geniculate; dorsum strongly arched, the carinæ depressed; surface finely roughened, ornamented with four longitudinal ridges, of which the part on each segment is apparently composed of three coalesced tubercles or granules; a deep median longitudinal sulcus, giving a resemblance to the *Platydesmidae*; last segment completely concealed by the greatly produced median pair of ridges of the nineteenth, which is canaliculate and deeply bifid when viewed from above; pores on very distinct special papillæ of segments 5, 7, 9, 10, 12, 13, 15, 16; color pale pinkish, concealed by the adhering soil; length 5.5, width 1.1 mm.; a single female specimen was found under a stone in a moist place in Freetown, Sierra Leone, January, 1896.

Pronodesmus melas.

First segment completely concealing the head, the anterior margin faintly lobed or scalloped, the upper surface with a few scattered conic tubercles; segments with two conspicuous longitudinal ridges, the prominences of each segment composed of two tubercles somewhat coalesced at base; below these ridges there is on each side a row of three small tubercles on each segment; pores located near the posterior corner of the carinæ, opening dorsad on inconspicuous rounded prominences of segments 5, 7, 9, 10, 12, 13, 15-18; eighteenth segment with processes coalesced in the median line, the resulting protuberance projecting as far caudad as the apex of the

last segment ; nineteenth segment with distinct carinæ, the processes much smaller than on the eighteenth ; last segment not concealed, apex very broad and rounded, dorsally rough like the other segments, two distinct notches on each side ; color black, legs, antennæ, and anal valves, white ; length 7 mm. ; width 1.5 mm. ; locality, Gede, West Java, 9,000 feet.

Myxodesmus lobatus.

With general resemblance to *Pronodesmus* and *Napodesmus*. Dorsum with four equal longitudinal rows, each of three conic tubercles on each segment ; pores located as in *Pronodesmus* ; lateral carinæ with three deep, narrow incisions, one in the lateral margin, two in the posterior, dividing the carinæ into three distinct lobes ; tubercles of the caudal segments not larger than those of the others ; last segment apically broad, entire, exposed ; color black above, antennæ, legs and anal valves white ; length 4.5 mm., width .9 mm. ; locality, Gœnceng Filœ, West Java, at an altitude of 8,000 feet.

Cynedesmus formicola.

First segment clypeate, concealing the head, the surface covered with rounded granules of different sizes, the anterior margin thin, flattened, forming a projecting horizontal rim ; segments covered with rounded granules somewhat regularly arranged, and with four equal longitudinal rows of three larger granules on each segment ; pores much as in *Stegodesmus*, on a special process from the post-corner of the areate carinæ of segments 5, 7, 9, 10, 12, 13, 15, 16 ; last segment large, broad and rounded at apex, with six small lobes or scallops ; color pinkish-brown, with fine black points ; length 7 mm., width 1.25 mm. ; locality, Grand Canary, in the nests of ants, at Telde and at Guia.